

**ABSTRACT**

A  $\text{CaF}_2$  buffer layer (3) is formed on a  $\text{CaF}_2$  (111) substrate (2) by an MBE method. Furthermore, a CuCl thin film is grown on the  $\text{CaF}_2$  buffer layer (3) by the MBE method while irradiating it with an electron beam to form an electron beam irradiation film (1a). Subsequently, a CuCl thin film is grown by the MBE method without the irradiation of electron beam to form an electron beam non-irradiation film (1b), thereby thus forming a CuCl thin film (a) including the electron beam irradiation film (1a) and the electron beam non-irradiation film (1b). Consequently, a CuCl thin film (1) exhibiting high planarity and crystallinity can be formed.